

Focus . . . Maternal Smoking Trends in Missouri: 1978-1997

Smoking during pregnancy is associated with reduced birth weight, increased fetal and infant morbidity, and other adverse pregnancy outcomes. Since the behavior is prevalent and these outcomes are considered to be preventable, trends in maternal smoking are of great interest to public health. This paper examines three aspects of trends in smoking among pregnant Missouri resident women: 1) changes in the rate of prenatal smoking by race and age of mother for the period 1978 through 1997; 2) changes in selected characteristics of the prenatal smoking population for 1992-94 and 1995-97; and 3) changes in selected characteristics of the prenatal population that smoked one pack of cigarettes or more per day for 1992-94 and 1995-97.

Data for this analysis comes from Missouri birth certificates for 1978 through 1997. The data set has smoking information on 98 percent of 1.5 million live births. Records with unknown smoking status are included in the study since they only comprise two percent of the total records. Of the records with unknown smoking status, 79 percent are resident births recorded in states other than Missouri. The smoking criterion on Missouri birth certificates for 1978 through 1988 was defined as "cigarettes smoked per day" with possible responses of "none," "less than a pack per day," and "a pack or greater per day". The criterion was revised in 1989 to conform to the US standard birth certificate, which asks whether tobacco was used during pregnancy and how many cigarettes were smoked each day on average. Mothers were categorized as smokers or non-smokers regardless of the number of cigarettes smoked. Those who smoked one pack (20 cigarettes) or more per day were classified as heavy smokers. Data for the total population includes all races.

The number and percent of women smoking during pregnancy was much lower in 1997 (14,409, 19.5 percent) than it was in 1978 (21,803, 30.0 percent). Figure 1 shows changes in the percent of maternal smoking by race and for the total population for 1978 through 1997. Given that the majority of women in Missouri are white, the trend line for all women is very similar to the white trend line. It is notable that the black rate of maternal smoking began above the white rate and ended below it, decreasing 61.2 percent over the 20 year period. By comparison, the white and total rates only decreased 28.9 and 35 percent respectively. However, in 1997 the black smoking rate rose for the first time since 1979, while the white rate continued to decline.

Figure 2 shows the percent of white women smoking during pregnancy by age group for the study period. During this time the rate for each age group sloped downward slightly. Among white women, teens had the highest rate of smoking over the entire 20 years, with the rate decreasing by age for all but the first three years. Among women under the age of 30, both the number and percent smoking during pregnancy decreased over 20 years. For white women age 30 and over, the percent smoking dropped but the actual number of women smoking increased. The number and percent of smoking teen and 20-24 year old mothers began to increase near the end of the period (1995 and 1996 respectively) after decreasing for most of the years.

Figure 3 shows the rates for black teens had the greatest change of any age group of either race, decreasing 76 percent from 1978 to 1997. The percent of maternal smoking dropped for all black age groups, yet the decrease among women age 30 and over was smaller than the other groups. In 1978 the percent of smokers 30 and over was the lowest among black women. By 1997 this group had the highest rate. Although the percent decreased, the number of black women age 30 and over that smoked actually increased.

A previous Focus article (May, 1991, vol. 25, no. 3) examined characteristics of women who smoked during pregnancy and of those who smoked heavily (a pack or more per day) for the years 1978-80 and 1986-88. Three years of data were used to reduce the random fluctuation of small numbers that were present in some areas. This paper uses a similar approach to compare these characteristics for the years 1992-94 and 1995-97.

Table 1 shows that the percentage of all women who smoked during pregnancy dropped 10.5 percent from 1992-94 to 1995-97. Among all characteristics reviewed, the greatest decreases for the total population, in descending order, were among women not on Medicaid (19.9 percent), women ages 25-29 (18.4 percent), married women (16.8 percent), women with at least 16 years of education (16.3 percent), and women living in Metropolitan Statistical Areas (MSA) (15.1 percent). In almost all cases, black rates were lower than white rates. The exceptions are among women age 30 and over, women having 16 or more years of education, and women having their fourth or greater birth. In each case the difference became smaller by 1995-97.

The only area in which an increase in smoking occurred was among teens, where both the number and percent increased. While no percent change for white teen mothers is shown on Table 1, both the number of live births and the number smoking increased for this segment of the population. The particular grouping of years for this study masks what is shown in Figure 2. The percent of white teens smoking while pregnant declined during 1992-94, then changed direction and nearly returned to the 1992 level during 1995-97. Among black teen mothers the rate increased 33.3 percent, as the number of live births to black teens dropped and the number of smokers rose. The increase in smoking among all pregnant teens made them the age group with the highest smoking rate.

Smoking characteristics identified in the May 1991 Focus article for marital status, education and birth order held for this study as well. Specific rates in all categories declined, and black rates continued to be smaller than white rates in most cases. The percent of unmarried women smoking during pregnancy continued to be higher than for married women. Rates of smoking continued to be higher for women without a high school education and continued to decrease as years of education increased. The percent smoking was lower for first births than for subsequent births, with the fourth or higher order birth having the highest rate. In addition, women receiving Medicaid had a higher percent smoking than women not on Medicaid. Each of these characteristics held for all women, regardless of race.

For 1995-97 a higher percentage of mothers who lived in rural areas smoked than those living in MSAs, regardless of race. The opposite had been true among black women for 1992-94.

Heavy smoking during pregnancy (i.e. one pack or more per day) decreased 20.8 percent among all women from 1992-94 to 1995-97. The percentage of heavy smokers declined for each characteristic, continuing the decreases reported in the May 1991 Focus article. The greatest decreases from 1992-94 to 1995-97, in descending order, were for non-Medicaid women (30.2 percent), married women (28.1 percent), women aged 25-29 (26.8 percent), women living in a Metropolitan Statistical Area (25 percent), women with 16 or more years of education (22.2 percent), and women having their second or third birth (20.5 percent). In every case, the rate of heavy smoking among white women was higher than the rate among black women (6.5 percent vs. 2.1 percent, overall respectively in 1995-97).

For black and white women, the characteristics of heavy smokers are the same except for age, where they are reversed. Heavy prenatal smokers are more likely to be unmarried, have less than a high school education, have had at least one previous live birth, receive Medicaid, and live in a rural area. Among black women heavy smokers are more likely to be 30 or older; among white women they are younger, age 20-24. For the total population, most women who smoke heavily during pregnancy are white.

It is evident that smoking during pregnancy has declined over several years. This decline has been shown to be consistent over several characteristics. It is also evident that maternal smoking has recently begun to increase among young women. When this portion of the population is examined by race, two different pictures emerge.

Although the percent of prenatal smoking among white teens declined between 1978 and 1997, this group maintained the highest rate of smoking among white women over that same period. Those in the 20-24 year age group maintained the second highest rate. This occurred at a time when percentages among women over age 24, and among all black age groups, fell at higher rates. The white teen rate never went below 30 percent and has increased since 1994 to 32.4 percent in 1997.

Among black women, the percent of teens that smoked during pregnancy dropped 76 percent over this period. It went from being the highest rate to the lowest rate among black women. Yet the black teen rate has increased every year since 1994 (5.2 percent to 8.6 percent in 1997). When the data was grouped in three year clusters, the black teen rate was the only rate among any age group, category or race to show an increase in smoking. Even with this increase the number of white teens smoking during pregnancy is over 10 times that associated with black teens (2,397 vs. 231 respectively for 1997).

If women who smoke during pregnancy are representative of the general population, then increasing rates for teens will mean increasing rates for all groups as the cohort ages. Smoking rates among the characteristics reviewed will also go up as young mothers have more children and older women have their first child. These results emphasize the need for more and better smoking avoidance programs targeted at young women. Further exploration of social and economic factors influencing smoking behavior is also indicated.

Figure 1
Percent of Women Smoking During Pregnancy by Race:
Missouri Resident Births 1978-97

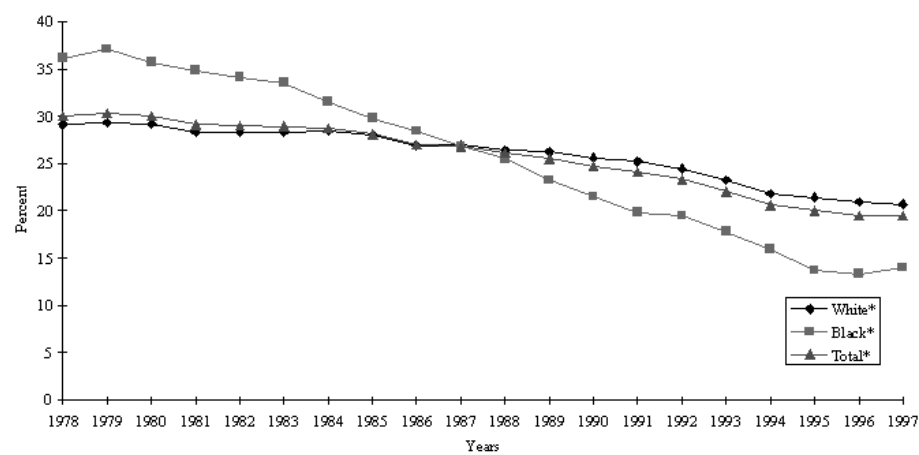


Figure 2
Percent of White Mothers Smoking During Pregnancy by Age 1978-97

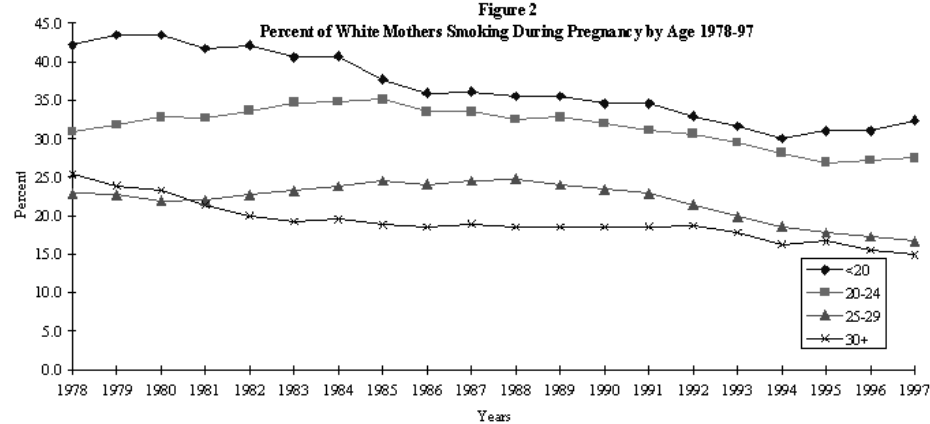
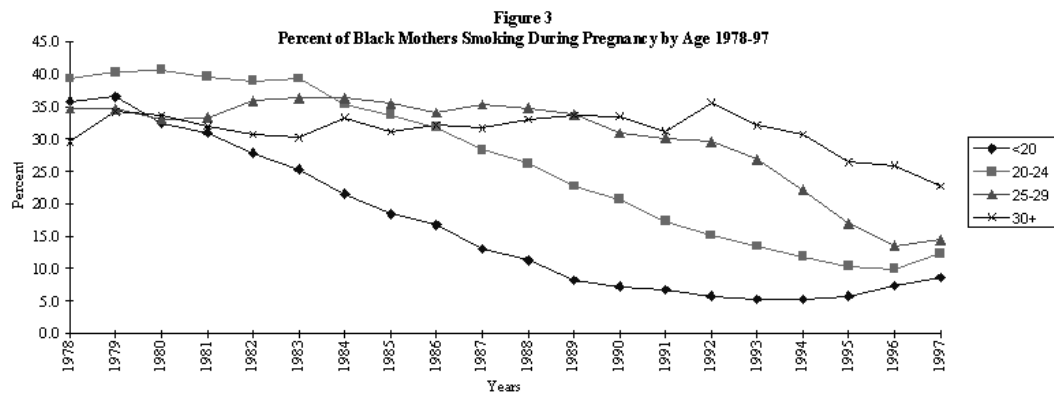


Table 1
|Percentage of Women Who Smoked During Pregnancy by Selected Characteristics by Race:
Missouri Resident Births 1992-1994 and 1995-1997

	Percent Smoking 1992-94			Percent Change 1995-97			Percent Smoking		
Smoking Category	Total	White	Black	Total	White	Black	Total	White	Black
Mother's Age									
Less than 20	23.3	31.5	5.4	24.7	31.5	7.2	6.0	0.0	33.3
20-24	26.0	29.4	13.5	24.0	27.2	10.9	-7.7	-7.5	-19.3

25-29	20.6	20.0	26.4	16.8	17.3	15.0	-18.4	-13.5	-43.2
30+	19.0	17.6	32.8	16.4	15.7	25.0	-13.7	-10.8	-23.8
Education (Years)									
Less than 12	40.2	48.0	21.7	38.6	45.5	19.0	-4.0	-5.2	-12.4
12	25.4	27.1	18.4	23.7	25.9	13.9	-6.7	-4.4	-24.5
13-15	15.5	16.2	12.5	14.1	15.1	8.8	-9.0	-6.8	-29.6
16 or more	4.3	4.2	7.1	3.6	3.6	3.9	-16.3	-14.3	-45.1
Birth Order									
First	17.4	19.6	7.0	16.3	18.1	6.6	-6.3	-7.7	-5.7
Second or Third	23.4	24.6	18.0	20.6	22.0	13.1	-12.0	-10.6	-27.2
Fourth or more	33.5	31.9	37.6	29.4	29.1	30.7	-12.2	-8.8	-18.4
Married	16.7	17.2	11.7	13.9	14.4	7.7	-16.8	-16.3	-34.2
Unmarried	33.2	43.5	19.4	31.6	41.2	15.3	-4.8	-5.3	-21.1
Medicaid	33.9	40.6	19.6	32.0	38.2	15.6	-5.6	-5.9	-20.4
Non Medicaid	14.1	14.3	13.6	11.3	11.6	9.5	-19.9	-18.9	-30.1
MSA*	20.5	21.6	18.0	17.4	18.7	13.6	-15.1	-13.4	-24.4
Non-MSA	25.7	26.3	15.5	25.0	25.6	14.3	-2.7	-2.7	-7.7
Total	22.0	23.2	17.8	19.7	21.0	13.7	-10.5	-9.5	-23.0

*Metropolitan Statistical Areas



Provisional Vital Statistics for June 1998

Live births increased in June as 6,086 Missouri babies were born compared with 5,486 in June 1997. Cumulative births also increased; by 0.2 percent for the six months ending with June and by 2.8 percent for the 12 months ending with June.

Deaths increased in June as 4,422 Missourians died compared with 4,369 one year earlier. However, cumulative deaths decreased for the 6- and 12-month periods ending with June.

The **Natural increase** in June was 1,664 (6,086 births minus 4,422 deaths). The natural increase went up for all three periods shown below.

Marriages decreased while **dissolutions of marriage** increased for all three time periods shown below. The marriage to divorce ratio for the 12 months ending with June decreased from 1.76 to 1.62.

Infant deaths increased slightly in June as 59 Missouri infants died compared with 53 in June 1997. Cumulative infant deaths for the 6- and 12-month periods ending with June decreased slightly.

PROVISIONAL RESIDENT VITAL STATISTICS FOR THE STATE OF MISSOURI

	June				Jan. June cumulative				12 months ending with June				
Item	Number		Rate*		Number		Rate*		Number		Rate*		
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1996	1997	1998
Live Births	5,486	6,086	11.6	13.6	36,684	36,765	13.7	13.6	72,603	74,662	13.8	13.5	13.8
Deaths	4,369	4,422	9.2	9.9	28,729	27,174	10.7	10.1	54,385	53,283	10.2	10.1	9.8
Natural increase	1,117	1,664	2.4	3.7	7,955	9,591	3.0	3.6	18,218	21,379	3.6	3.4	3.9
Marriages	5,375	4,891	11.3	10.9	20,961	19,143	7.8	7.1	44,639	41,994	8.4	8.3	7.7
Dissolutions	2,168	2,476	4.6	5.5	12,666	12,929	4.7	4.8	25,354	25,883	4.8	4.7	4.8
Infant deaths	53	59	9.7	9.7	319	313	8.7	8.5	611	562	7.1	8.4	7.5
Population base (in thousands)	...	...	5,402	5,440	...	...	5,402	5,440	...	...	5,345	5,383	5,421

*Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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